1: Int J Biol Markers. 1992 Jul-Sep;7(3):137-42. Related Articles, Links

The CEA family: a system in transitional evolution?

Stanners CP, Rojas M, Zhou H, Fuks A, Beauchemin N.

McGill Cancer Centre, McGill University, Montreal, Quebec-Canada.

The CEA family consists of two structurally and functionally distinct sub-groups; the group including CEA, NCA and CGM-6 which are cell surface-bound by phosphatidyl-inositol (PI) linkages, and the group of BGP splice variants which have trans-membrane and cytoplasmic domains. Although all CEA family members mediate intercellular adhesion in vitro, the PI-linked group show Ca++ and temperature independent adhesion whereas the BGP group show rapidly reversible Ca++ and temperature dependent adhesion. From the close alignment in cDNA nucleotide sequences between family members and between repeated domains in one family member, it is apparent that the CEA family is now rapidly evolving; in fact, analogs of only the trans-membrane BGP group have been found so far in the mouse. The addition of a new group of potent adhesion molecules to complex species at some time after the rodent radiation has strong evolutional implications, which are discussed.

Publication Types:
- Review
- Review, Tutorial

PMID: 1431335 [PubMed - indexed for MEDLINE]

1: Int J Biol Markers. 1992 Jul-Sep;7(3):132-6. Related Articles, Links

Introduction to the CEA family: structure, function and secretion.

Von Kleist S.

Institute of Immunobiology, University of Freiburg, Medical Faculty, Germany.

Due to the phenomenal progress in the field of tumor immunology that took place during the last twenty years, we dispose today of highly specific and sensitive techniques and reagents like monoclonal antibodies (MAbs). In this context the discovery in human carcinomas of tumor-associated antigens, such as CEA, was of primary importance, especially since the latter was found to have clinical relevance as a tumor marker. Based on animal models, a new in vivo technology for the detection of tumors and metastases was developed in recent years, that uses anti-CEA MAbs, or fragments of them, coupled to radio-isotopes. This technique, called radio-immunodetection (RAID), also paved the way for immunotherapeutic procedures, where again CEA served as the target-antigen. This new technique holds great promise, provided the epitope-specificity of the MAbs is well-controlled: it has been shown that CEA belongs to a large gene-family of at least 22 members, which can be subdivided into two subgroups (i.e., the CEA- and the PSG-subgroup) and which in turn belongs to the immunoglobulin-supergene family. Great structural similarities render the distinction of the various cross-reactive molecules by immunological means rather difficult.

Publication Types:
- Review
- Review, Tutorial

PMID: 1431334 [PubMed - indexed for MEDLINE]

1: Semin Cancer Biol. 1999 Apr;9(2):67-81. Related Articles, Links

The carcinoembryonic antigen (CEA) family: structures, suggested functions and expression in normal and malignant tissues.

Hammarstrom S.

Department of Immunology, Umea University, Umea, SE-90185, Sweden.

The human CEA family has been fully characterized. It comprises 29 genes of which 18 are expressed; 7 belonging to the CEA subgroup and 11 to the pregnancy specific glycoprotein subgroup. CEA is an important tumor marker for colorectal and some other carcinomas. The CEA subgroup members are cell membrane associated and show a complex expression pattern in normal and cancerous tissues with notably CEA showing a selective epithelial expression. Several CEA subgroup members possess cell adhesion properties and the primordial member, biliary glycoprotein, seems to function in signal transduction or regulation of signal transduction possibly in association with other CEA sub-family members. A modified ITAM/ITIM motif is identified in the cytoplasmatic domain of BGP. A role of CEA in innate immunity is envisioned. Copyright 1999 Academic Press.

Publication Types:
- Review
- Review, Tutorial

PMID: 10202129 [PubMed - indexed for MEDLINE]

1: Int J Cancer. 1998 Mar 30;76(1):148-53. Related Articles, Links

Expression of four CEA family antigens (CEA, NCA, BGP and CGM2) in normal and cancerous gastric epithelial cells: up-regulation of BGP and CGM2 in carcinomas.

Kinugasa T, Kuroki M, Takeo H, Matsuo Y, Ohshima K, Yamashita Y, Shirakusa T, Matsuoka Y.

Department of Surgery, School of Medicine, Fukuoka University, Japan.

Four human carcinoembryonic antigen (CEA) family members, CEA (CD66e), non-specific cross-reacting antigen (NCA, CD66c), biliary glycoprotein (BGP, CD66a) and CEA gene-family member 2 (CGM2), are expressed in normal mucosal epithelia of the colon. Expression of BGP and CGM2 has recently been demonstrated to be down-regulated in colorectal adenocarcinomas. We have now investigated the expression of the 4 CEA family antigens in gastric adenocarcinoma and carcinoma cell lines in comparison with adjacent normal gastric mucosa. The transcripts of the CEA, NCA and BGP genes evaluated by reverse transcription-polymerase chain reaction were detectable at various levels in all the gastric adenocarcinoma cell lines tested, while CGM2 mRNA was detectable in the cell lines of poorly differentiated but not of well-differentiated carcinomas. The levels of CEA mRNA in normal gastric mucosa were variable but mostly increased in adenocarcinomas. The sparse expression of NCA observed in the normal tissues was markedly up-regulated in the carcinomas. In contrast to previous findings on normal and cancerous colonic tissues, the transcripts of CGM2 were totally undetectable and those of BGP were recognized only marginally, if at all, in normal gastric mucosa, while both messages were detected at significant levels in most of the gastric adenocarcinomas. This was confirmed by in situ hybridization. Our findings indicate that expression of the CEA family antigens, particularly that of BGP and CGM2, is differently regulated in epithelial cells of the colon and the stomach.

PMID: 9533775 [PubMed - indexed for MEDLINE]